(No Model.)

6 Sheets—Sheet 1.

C. FREDERICK & R. L. PLUMLEY.

SEWING MACHINE.

No. 573,969. Patented Dec. 29, 1896.

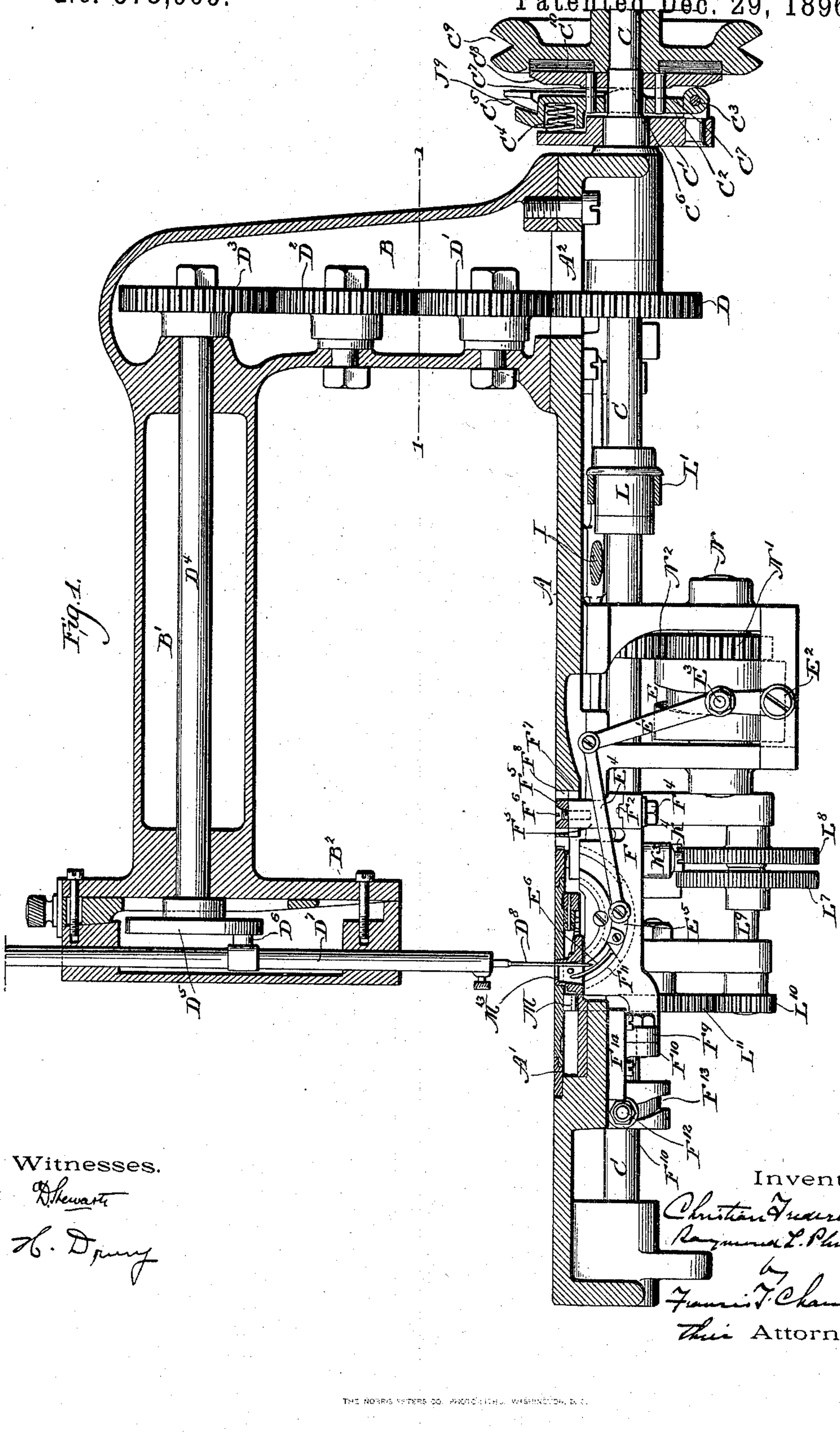

Fig. 1.

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(No Model.) 6 Sheets—Sheet 2.

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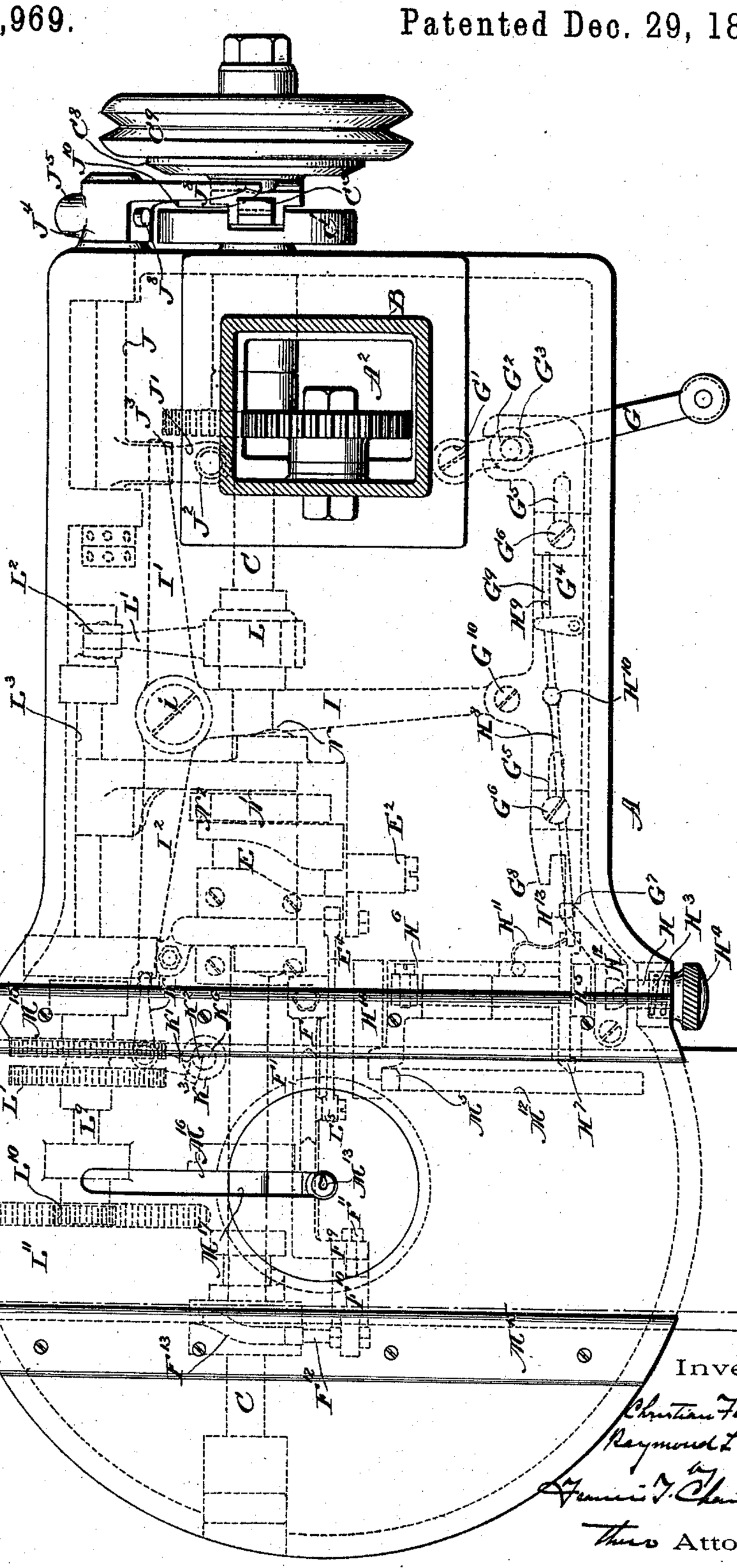
SEWING MACHINE.

No. 573,969. Patented Dec. 29, 1896.

FIG. 2.



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(No Model.) 6 Sheets—Sheet 3.

C. FREDERICK & R. L. PLUMLEY.

SEWING MACHINE.

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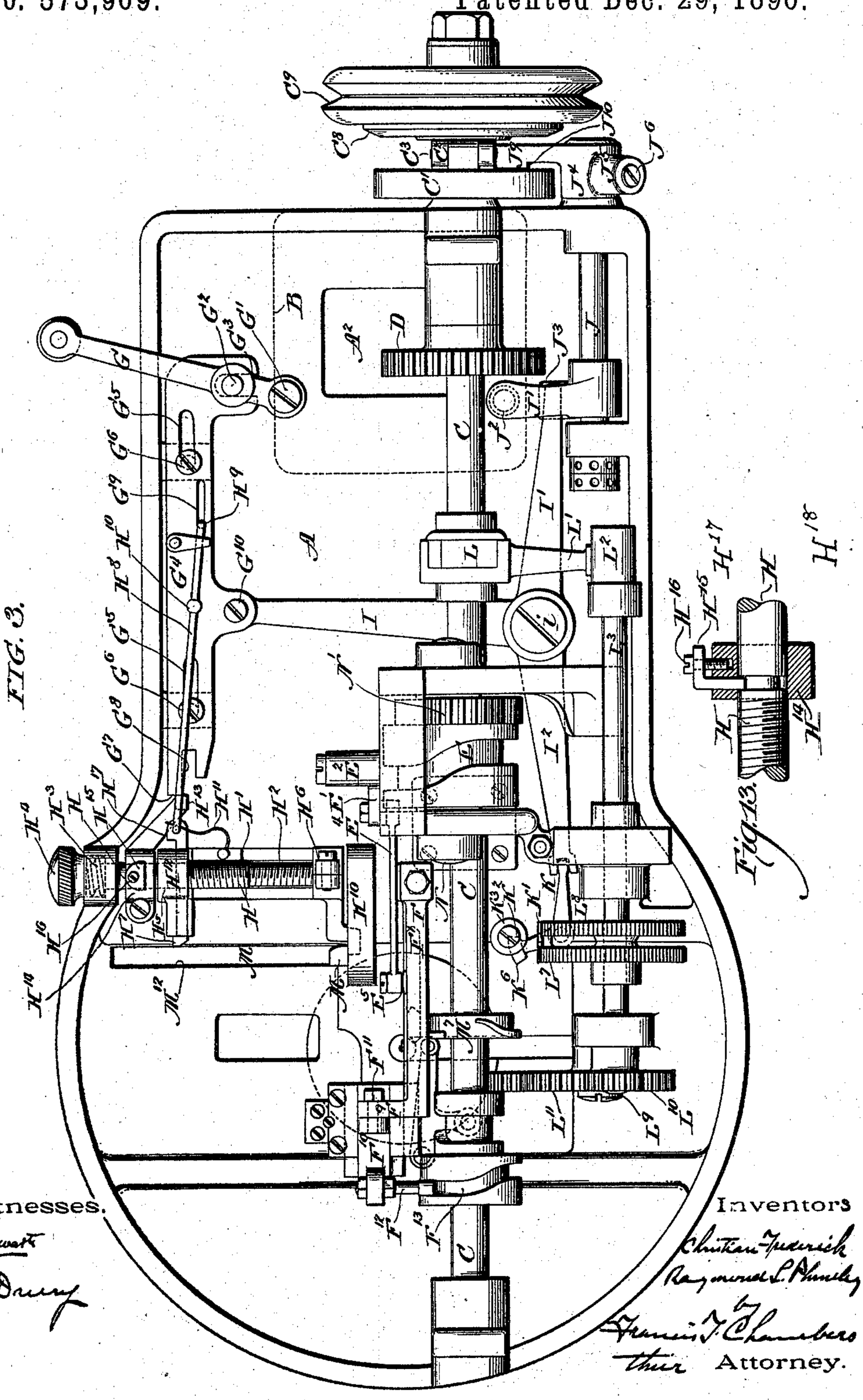

FIG. 3.

Fig. 13.

Witnesses.
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SEWING MACHINE.

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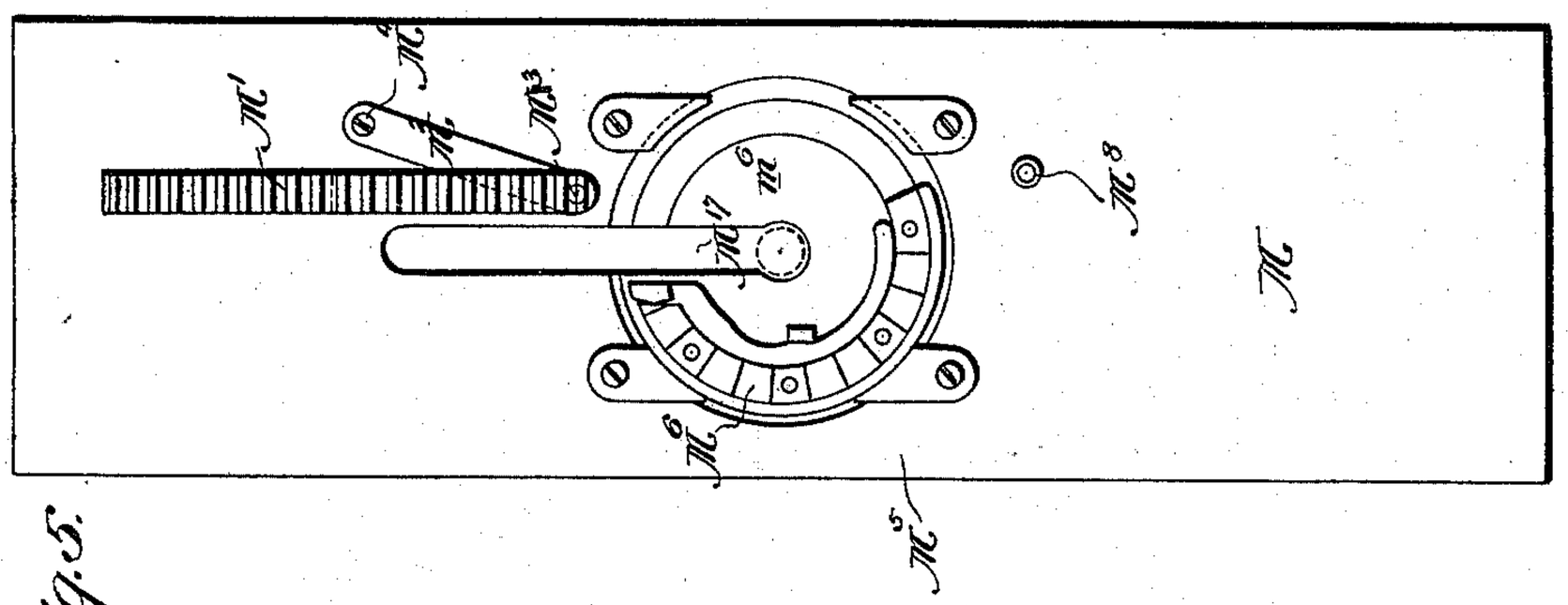

Fig. 5.

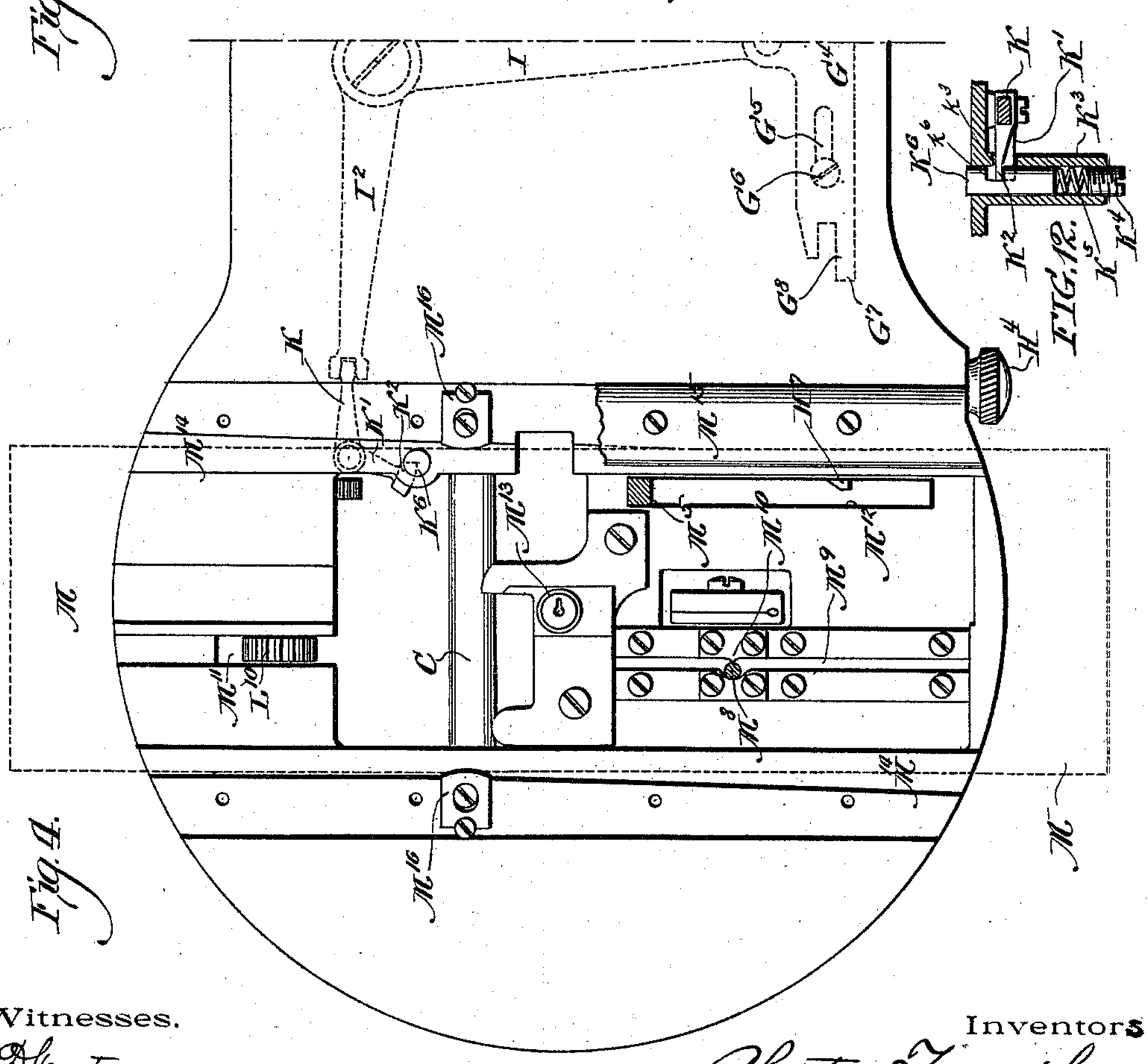

Fig. 4.

FIG. 12.

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(No Model.) 6 Sheets—Sheet 5.

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SEWING MACHINE.

No. 573,969. Patented Dec. 29, 1896.

FIG. 6.

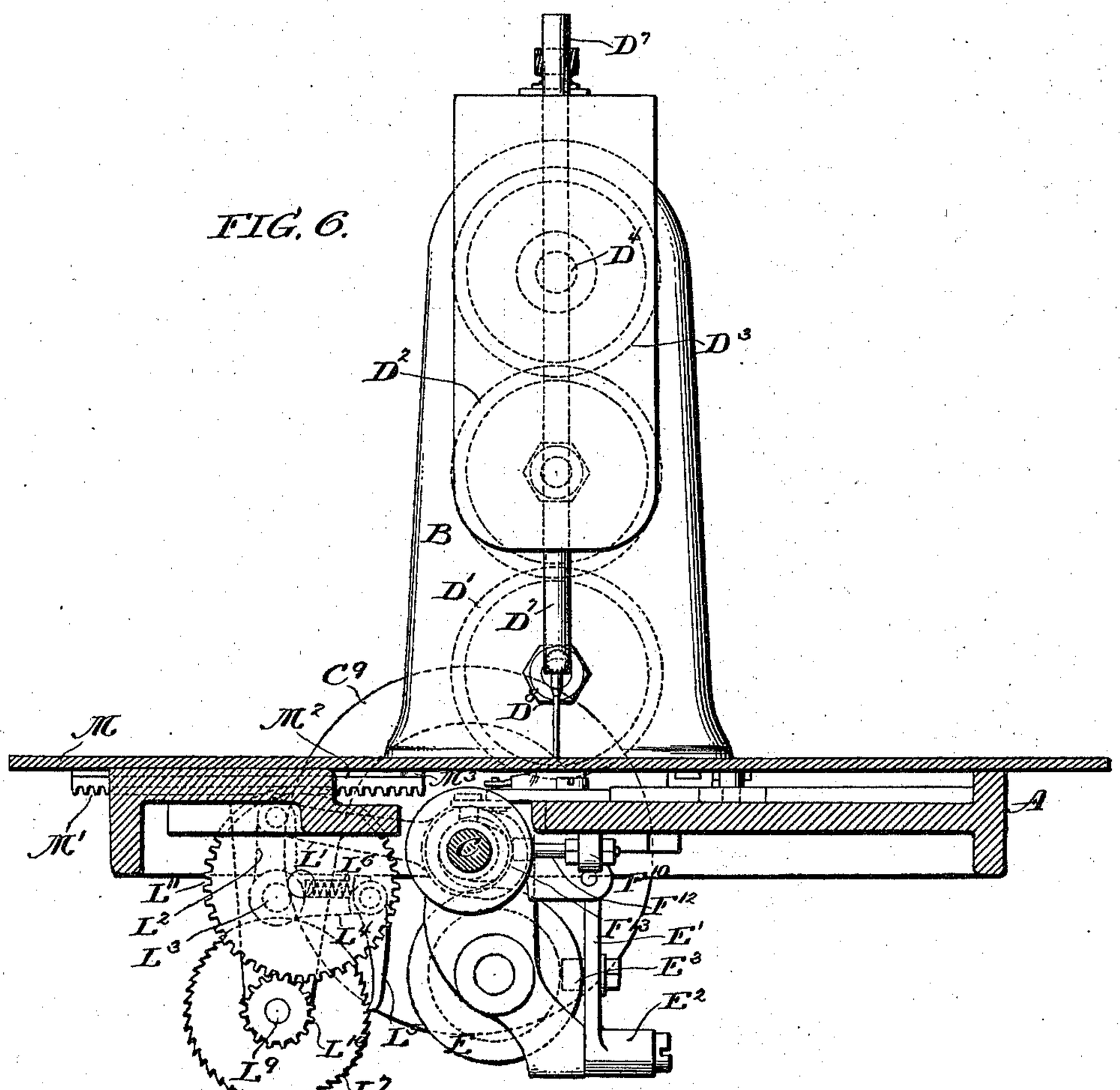
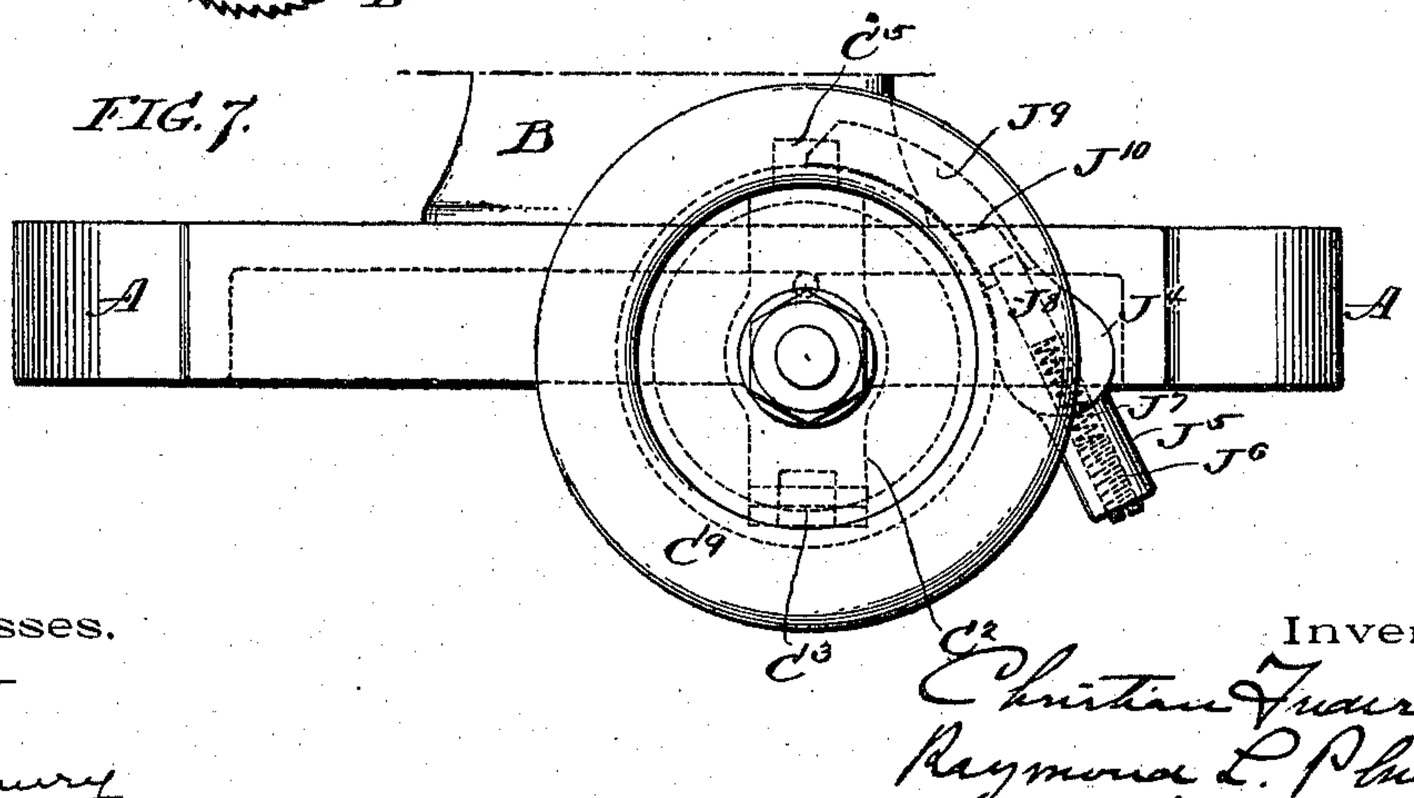


FIG. 7.



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SEWING MACHINE.

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Fig. 8

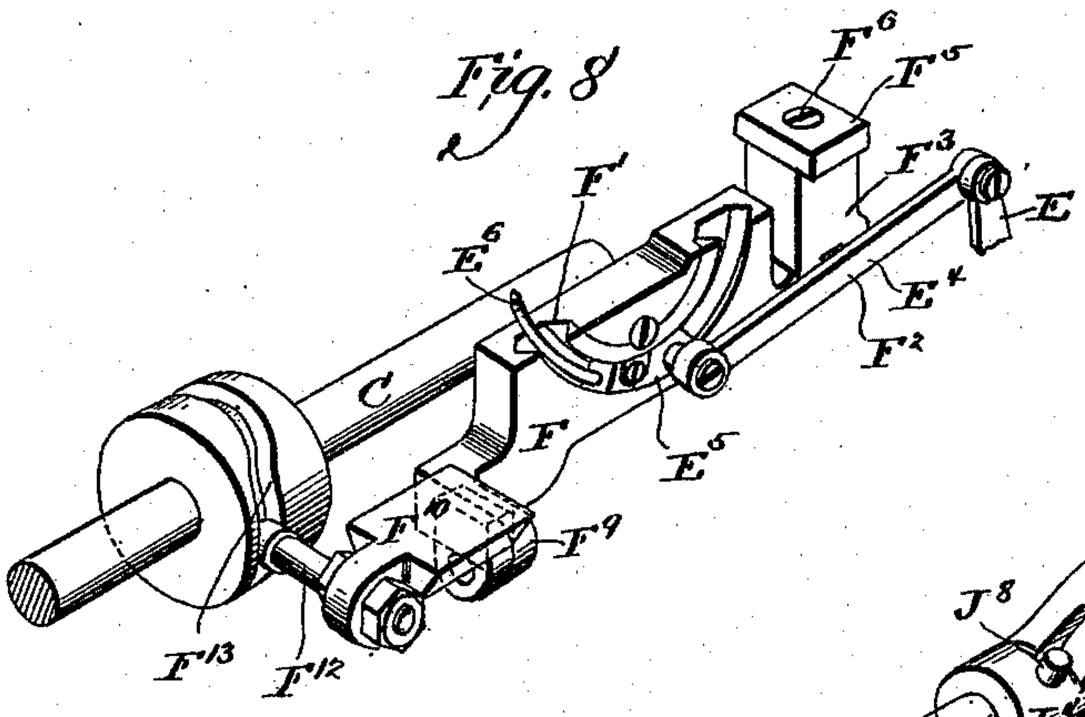


Fig. 9.

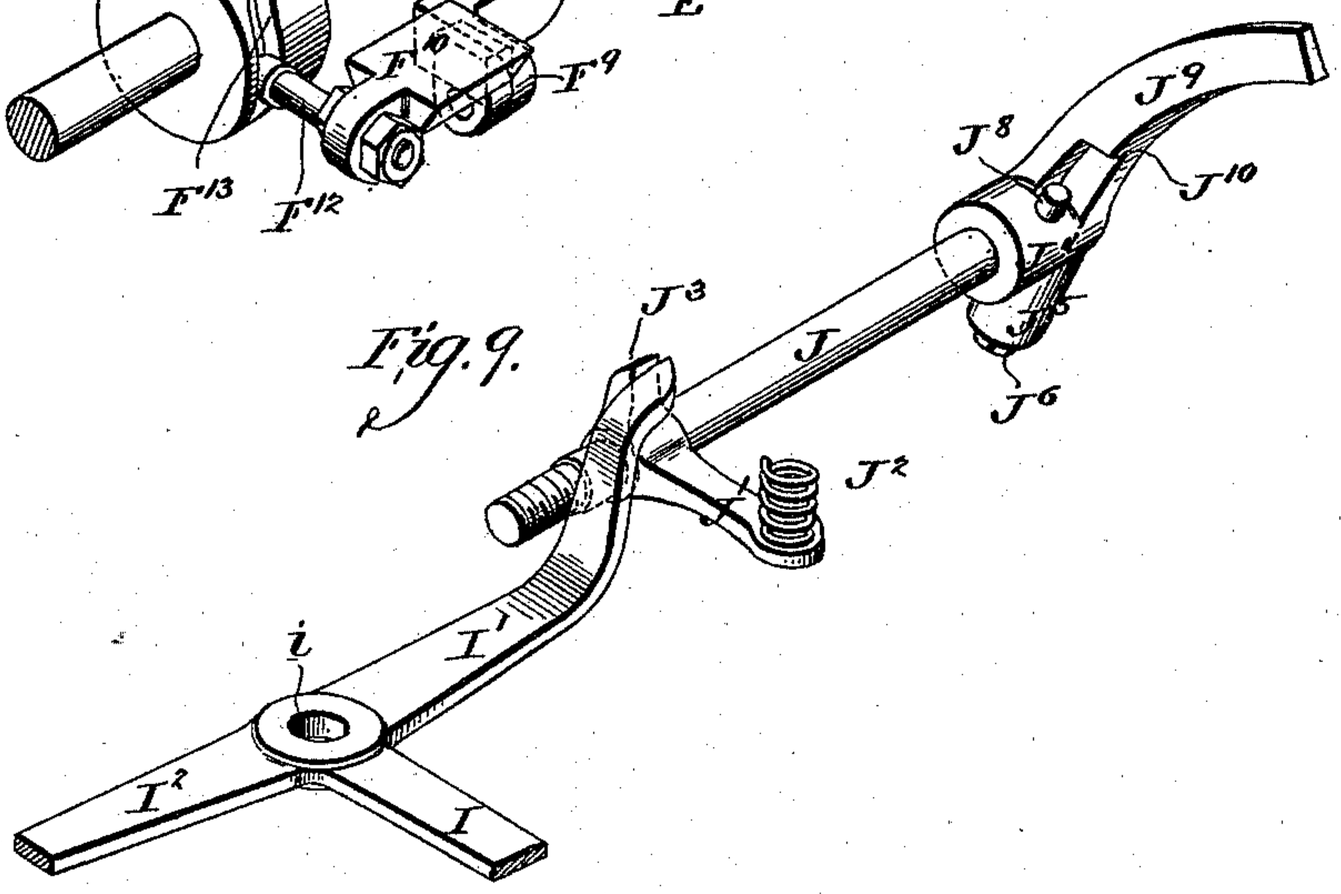


Fig. 10.

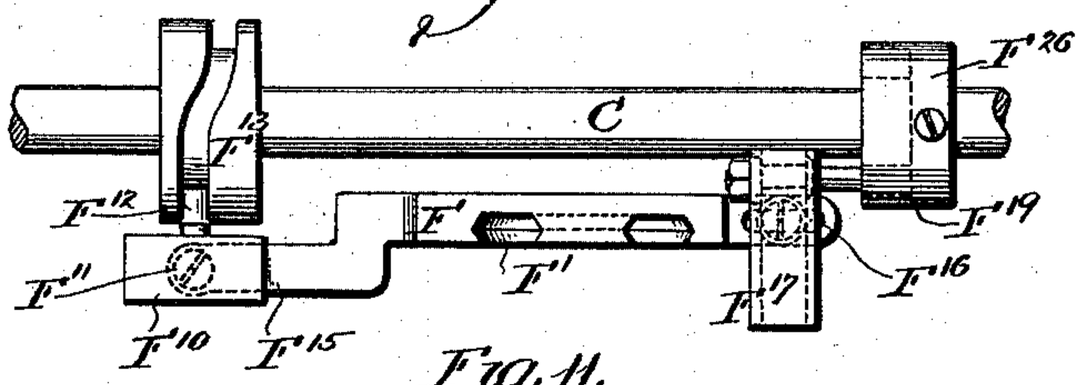
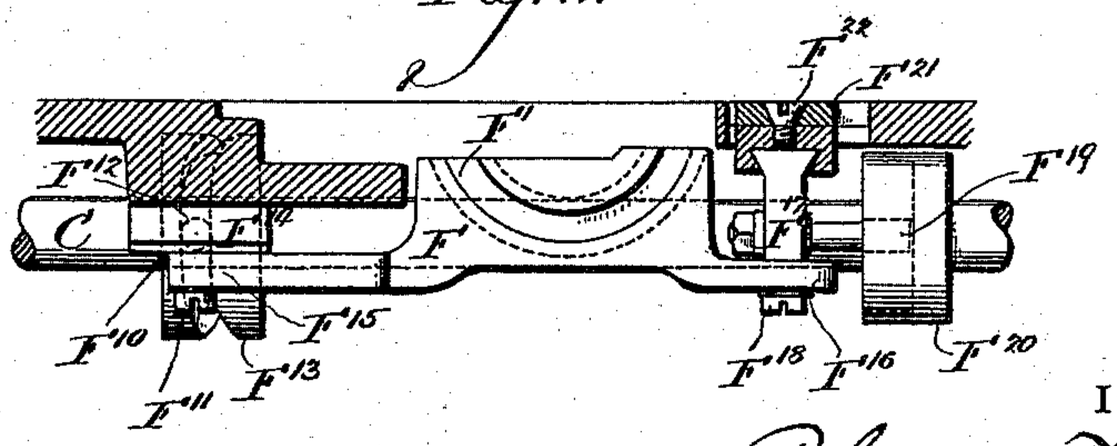


Fig. 11.



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H. Drury

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UNITED STATES PATENT OFFICE.

CHRISTIAN FREDERICK AND RAYMOND L. PLUMLEY, OF WILMINGTON, DELAWARE, ASSIGNORS TO THE TRUMP BROTHERS MACHINE COMPANY, OF SAME PLACE.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 573,969, dated December 29, 1896.

Application filed May 29, 1896. Serial No. 593,544. (No model.)

To all whom it may concern:

Be it known that we, CHRISTIAN FREDERICK and RAYMOND L. PLUMLEY, citizens of the United States of America, residing in Wilmington, in the county of New Castle, in the State of Delaware, have invented a certain new and useful Improvement in Buttonhole-Sewing Machines, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

Our invention relates to buttonhole-sewing machines, and particularly to machines of the class shown and described in the patent to Mills and Moore, No. 439,599, of October 28, 1890.

The object of our invention is, in the first place, to provide an improved construction of mechanism for operating the lower needle or looper of the machine, whereby the formation of the stitch is simplified, and particularly we are enabled to use a shorter upper needle. We have also materially improved the machine in respect to the arrangement and mode of operation of the stops, whereby the length of the buttonhole is gaged and the machine arrested on the completion of a buttonhole. We have also improved the mechanism for applying tension during the movement of the sliding plate, and an important feature of our improvements is the provision of clutch mechanism whereby the machine is brought to a standstill on the completion of its work with little or no jar and with the needles always in a fixed determined position, the position of course being that which permits the withdrawal of the work and the insertion of new work.

The nature of our improvements will be best understood as described in connection with the drawings, in which they are illustrated in connection with mechanism of the same general character as that shown in the Mills and Moore machine hereinabove referred to, and we have omitted from the drawings many parts which are not immediately connected with our invention and which may be constructed either like the parts shown in the Mills and Moore machine or in any other convenient way.

In the drawings, Figure 1 is a side elevation of the machine, partly in section. Fig. 2 is a plan view of the machine on the section-line 1 1 of Fig. 1, the parts below the bed-plate of the machine being shown in dotted lines. Fig. 3 is a plan view of the machine in a reversed position—that is, looking at the position from the bottom or underneath the bed-plate. Fig. 4 is a plan view of the left-hand end of the machine as shown in Fig. 2 with the plate M removed. Fig. 5 is a plan view of the under or lower side of the sliding plate M. Fig. 6 is an end elevation of the machine on the section-line x x of Fig. 2. Fig. 7 is an end elevation of the right-hand end of the machine as shown in Fig. 2, only so much being shown as relates to the driving-pulley and clutch mechanism. Fig. 8 is a perspective view of the mechanism directly connected with the lower needle or looper. Fig. 9 is a perspective view of a portion of the clutch-actuating mechanism. Fig. 10 is a plan view, and Fig. 11 a side elevation, of a modified form of mechanism for actuating the lower needle or looper. Fig. 12 is a sectional view showing the friction-pin K^6 and parts connected therewith; and Fig. 13 is a sectional view of the adjustable stop-holder H^5, showing the way in which it is secured to the adjustable screw H.

A indicates the frame or bed-plate of the machine; B B′ B^2, the standard and arm supporting the upper needle and mechanism for driving it.

C is the main driving-shaft of the machine, and, referring first to the clutch mechanism for driving this shaft, C′ is a disk firmly secured to the shaft C and to one side of which is pivotally secured at C^3 an arm C^2, which arm is pressed outward from the disk C′ by the action of a spring C^4, which, in the construction shown, acts upon the outer or free end of the arm C^2.

C^5 indicates the extreme free end of the arm C^2, the conformation of which should be such as to insure its engagement by the arm J^9, to be hereinafter described.

C^7 C^7 are pins by which the arm C^2 is connected to a disk C^8, so as to insure the turning of the disk with the arm C^2 and the shaft

C. The actual contact between the arm C^2 and the disk C^8 is preferably made by a rounded projection C^6 on the arm, as is best indicated in Fig. 1 of the drawings.

C^9 is the driving-pulley of the machine, which is loosely journaled on the end of the shaft C, and is coupled therewith through the action of the clutch mechanism described, the spring C^4, acting through the arm C^2, pressing the disk C^8 against the side of the pulley C^9, friction-washers, as indicated at C^{10}, being preferably interposed between the pulley and the disk C^8.

It will be observed that the action of the parts hereinabove described is such as to keep the pulley normally coupled or engaged with the shaft. The disengagement is effected by the movement of a shaft J. (See Figs. 2, 3, 7, and 9.) This shaft is secured in bearings on the frame of the machine so as to have a free oscillation thereunder, and to the end of the shaft is secured a cam-arm J^9, which, when the shaft J is turned so as to move it upward, clears the arm C^2; but when the shaft J is moved downward it carries the cam-arm J^9 downward, so that as the arm C^2 revolves its end C^5 will come in contact with the cam-surface of the arm J^9, and be gradually pushed backward, compressing the spring C^4 and of course releasing the pressure exerted by the disk C^8 on the side of the pulley C^9. We also secure to the end of the shaft J a spring-buffer, against which the arm C^2 comes in contact after the clutch has been substantially uncoupled, so as to arrest the motion of the shaft C in a fixed and determined position. This spring-buffer in the construction shown consists of a pin J^8, secured in a cavity of a heel extension J^5, projecting laterally from the hub J^4, from which extends the cam-arm J^9 and which is secured to the shaft J. A spring J^7, also lying in the extension J^5, presses the pin J^8 outward, and the tension of this spring is regulated by means of the screw-plug J^6, (these parts being best shown in Fig. 7,) and in order to avoid any tendency to rebound or turn backward in the shaft we form near the bottom of the cam-arm J^9 a depression J^{10}, into which the end of the arm C^2 is forced by the spring C^4, so that the arm is in effect locked between the spring-buffer and the shoulder on the outside of this depression. In this way it will be obvious we secure the fixed and absolute stoppage of the machine in the desired position.

J′ is a lever-arm projecting out substantially horizontal from the shaft J, and between which and the bed-plate of the machine we place a spring, as indicated at J^2. The action of this spring is to turn the shaft in the direction which causes the arm J^9 to come into operative position with regard to the clutch-arm C^2, J^3 indicating another lever-arm extending out from the shaft J, by which in the construction shown we effect the movement of the shaft J in the opposite direction to that in which it is moved by the spring J^2, and of course for the purpose of disengaging the arm J^9 from the clutch and thus causing the clutch to come into operation. In the construction shown the arm I′ of a lever I I′ rests against the lever J^3, the arm I being pivotally connected with a sliding plate G^4, to which plate motion is imparted by a lever G, pivoted at G′ and engaged by means of a pin G^2 with a slot G^3 in the end of the plate G^4. By moving the lever G toward the right, as shown in Figs. 2 and 3, the clutch is caused to engage the driving-pulley and driving-shaft by the mechanism which we have already described, while of course a movement of the lever G or of the plate G^4 toward the left effects the disengagement of the clutch and the stoppage of the machine, and we may state that the spring J^2 should be of such power as to effect this disengagement and stoppage of the machine in the absence of some positive stop or lock to prevent the movement of the sliding plate G^4 toward the left.

D is a gear-wheel secured on the driving-shaft C and communicating motion through the gears D′ D^2 D^3 to the shaft D^4, which shaft, through the disk D^5 and pin D^6, communicates motion to the reciprocating rod D^7, to the lower end of which is secured the needle D^8.

E is a cam the function of which is to impart a reciprocating movement to the race-block, to which is attached the lower needle or looper. This cam, in our preferred construction, is secured to a counter-shaft N, held in a bracket from the frame of the machine and receiving motion from the pinion N^2 on the shaft C, which engages with the pinion N′ on the counter-shaft N. Through a cam pin or roller E^3 the cam E communicates motion to a lever E′, pivoted at E^2 and connected at its free end with the connecting-rod E^4, which in turn is pivotally connected to the race-block E^5. This method of driving the race-block from the shaft C is much more direct and decidedly more advantageous than the constructions which have heretofore been employed for a similar purpose.

The race-block E^5 moves in a curved raceway F′, formed in the race-frame F. Race-frames of this character have heretofore been given a sidewise oscillating movement, and this movement either may or may not be employed in connection with our improvements. We, however, have given the race-frame a reciprocating longitudinal movement, which materially modifies the movement of the lower needle or looper.

In our preferred construction one end of the race-frame (that to the right hand, as shown in Fig. 1) is secured by means of a screw F^4 and preferably a mortise F^2 to a depending arm F^3, which arm extends through a slot F^7 in the bed-plate of the machine and is secured by a screw F^6 to a slide F^5, which rests on flanges F^8 F^8, lying to each side of the slot F^7, the slot being of sufficient length to permit the desired reciprocating longitudinal movement of the race-frame, and this

movement is imparted to the race-frame by a cam F^{13}, secured to the driving-shaft C and connecting through a pin or roller F^{12} on a slide F^{10}, the slideways being indicated at F^{14} and the race-frame being secured to the slide by means of a screw F^{11}, which, as shown in Figs. 1 and 3, passes through a right-angled lug F^{9} of the race-frame and through a downwardly-projecting lug of the slide F^{10}. In the modifications of this mechanism shown in Figs. 10 and 11 the longitudinal reciprocating motion is imparted to the race-frame F by the cam F^{13}, the construction on the connecting parts being somewhat modified, but only in an obvious and easily-understood manner. In place of forming a slot in the bed-plate for the longitudinal movement of the race-frame we provide in the construction shown in these figures a slot F^{16}, formed in an extension of the race-frame itself, a screw F^{18}, passing through this slot and serving both as a pivot and as a connection, securing the race-frame to the base of a slide F^{17}, which slide extends up through a slot in the bed-plate and is connected by a screw F^{22} with a slide-plate F^{21}, resting on the bed-plate, a cam pin or roller F^{19}, engaging with a cam F^{20}, serving to give the transverse reciprocating movement to the race-frame and the parts connected therewith.

Returning now to the sliding plate G^4, it will be observed that this plate is supported by screws G^6 G^6, passing through slots G^5 in the plate, which permit the necessary reciprocating movement. The plate is also provided with an end G^7, which serves as a stop or abutment, the plate being cut away or recessed, as indicated at G^8, for the purpose of securing its release at the proper time, as will be hereinafter described. The plate is also provided with a slot G^9, the position and length of which are regulated by conditions which will best be understood in connection with the description of other parts of the machine, and the motion of the plate G^4 is communicated to the lever-arm I by a pivot connection, (indicated at G^{10}.)

H is the adjusting-screw of the machine, provided with right and left screw-threads, as indicated at H′ and H^2, and having a spring H^3 operating to keep the adjusting-screw pushed outward in its normal position, this spring acting against a head H^4, which lies on the outside of the frame of the machine and by which the adjusting-screw can be pressed in when desired.

H^5 is a stop-holding clamp internally threaded and engaged with screw-thread H′. It is also provided with a transverse slot or opening in which moves the latch-stop H^7, H^{11} being a spring which normally acts to press the latch-stop outward, so that it will project over the edge of the slot M^{12}, and H^8 is a connecting-rod secured at one end to the end of the latch-stop H^7 and having a bent end H^9, which extends into the slot G^9, H^{10} being a handle on the rod H^8.

H^6 indicates the threaded clamp and lower or fixed stop, the clamp screwing on the threaded portion H^2 of the adjusting-screw H, and the end of the stop H^6 lying over the edge of the slot M^{12}, formed through the bed-plate of the machine.

H^{14} is a clamp secured so as to move longitudinally with the adjusting-screw H, and to retain a fixed position thereon irrespective of the change in position of the stops H^7 and H^6. This is effected in the construction shown by providing (see Fig. 13) the adjusting-screw H with an annular slot H^{18}, into which projects the edge H^{17} of a plate H^{15}, which extends through a slot h^{14} in the clamp H^{14}, and is secured on the outside of the clamp by one or more screws, as indicated at H^{16}. The block H^{14} serves as a stop to prevent the outward movement of the adjusting-screw H beyond a determined point, and projecting beyond this clamp is an arm H^{13}, arranged in such position with respect to the end G^7 of the plate G^4 as to engage and hold it in the position shown in Figs. 2 and 3, that is to say, in the position it occupies when the driving-pulley and main shaft are coupled. When the screw H is pressed in either by the action of the slide M or by the pressure of the operator against the head H^4 of the adjusting-screw, the stop H^{13} is depressed below the end G^7 of the sliding plate, and said plate is then enabled to move toward the left with the effect of uncoupling the driving-pulley from the shaft through the mechanism already described, and we will here state that the slot G^9 in the plate G^4 is so placed that when the plate G^4 is drawn back to the position shown in Fig. 3 it draws, by means of the rod H^8, the latch-stop H^7 back to the position shown in Fig. 3, so that its end does not project over the slot M^{12}. The length of the slot G^9 is such as to permit the movement of the rod H^8 toward the right even when the plate G^4 occupies the position farthest to the left, so that the operator, by taking hold of the handle H^{10}, can at all times move the latch-stop H^7 backward, so as to permit free movement of the slide M.

M is a sliding plate to which the rotatable table upon which the work is clamped is secured. This sliding plate rests upon guideways M^{14} M^{14} on top of the bed-plate of the machine, and is held in position by the overlapping edges of plates M^{15}. The plate M is not so broad as the guideways upon which it rests, and is free to move from side to side through a short distance, being centered only by the adjustable plates M^{16} M^{16}, which permit it to move from side to side on each side of said plates, but hold it substantially in one position at the point at which these plates come in contact with it. The reciprocating movement is given to the plate M through a rack M′, secured on its under side to the free end M^3 of a link or arm M^2, pivotally connected to the plate M at M^4. The rack M′ moves in a slot m^{11} in the bed-plate of the machine, the portion M^{11} being cut through to permit the passage of the gear-wheel L^{11}, which gear-

wheel is engaged by the gear L^{10}, secured on shaft L^9, to which shaft are also secured ratchet-wheels L^7 and L^8, one being of finer teeth than the other, and the two being adjustable along the shaft and secured in position to bring either ratchet into play, as desired.

The ratchet-wheel is directly actuated by the pawl L^5, depending from the end of a lever L^4 and held in contact with the ratchet-teeth by a spring L^6, acting against its butt-end and in turn abutting a shoulder on the lever or arm L^4. This lever is secured to a shaft L^3, and this shaft has extending from it a lever-arm L^2, connected by a connecting-rod L' with a cam L on the shaft C. All of these parts above described in connection with the actuation of the sliding plate M are of a construction generally well known and therefore need not be further explained or illustrated. The one feature which is novel and which we desire to claim in this connection is the mode of attaching the rack M′ to the plate M through a pivot-arm M^2, that is to say, the arm pivoted both to the rack and to the sliding plate and arranged at a slight angle with the line which the rack occupies in place. This construction we have found to obviate a difficulty which was met with when the rack was pivoted to the plate M directly, this difficulty consisting of a tendency to make the stitches on one side of the eye of the buttonhole closer than the stitches on the other side. By connecting the rack through the arm M^2, arranged as shown and described, this difficulty is entirely overcome.

The rotating table (indicated at m^6) is held upon the plate M in the usual way and rotated at a proper time by means of its teeth, (indicated at M^6,) and upon which the rotating worm M^7 (see Fig. 3) operates in a well-known manner. The rotating table is slotted at M^{17} and the slide slotted at M^{16} to permit the necessary longitudinal movement of the slide M, the button M^{13} extending up through this slot.

The bed-plate is provided with a transverse groove M^9, having an offset M^{10}, and the slide M is provided with a downwardly-extending pin M^8, which works through this groove M^9, the offset giving the necessary side motion to the plate M at the proper time and in a familiar and well-known manner.

A transverse slot M^{12} is formed through the bed-plate, lying parallel and close to the adjusting-screw H and in such position that the spring-latch H^7 projects over the edge of the slot except when drawn back, while the stationary stop H^6 always extends over the edge of the slot. A downwardly-projecting lug M^5 extends from the sliding plate M into and through this slot M^{12}, being in such a position as to engage and by positive and direct abutment with the stops H^7 and H^6.

In operating our machine the adjusting-screw H is turned so that the position of the stops H^7 and H^6 will correctly gage the length of the buttonhole to be made. The slide M is then moved outward, so that its downwardly-extending lug M^5 will lie outside of the spring-latch H^7, the conformation of the end of the latch being such that it will be pushed out of the way as the slide is moved outward. Then the goods being arranged on the rotating table and the hole cut in them, the slide is moved by hand until the projection M^5 comes in contact with the end of the spring-latch H^7. At this time the adjusting-screw H is pushed in, the stop H^{13} lying beneath the end of the plate G^4 and against the edge, (indicated at G^8,) and of course it will be understood that the spring-latch H^7, the plate G^4 being in its position farthest to the left, will be held by a spring H^{11}, so that it will project over the groove M^{12}. The operator then moves the handle G toward the right, as shown in Figs. 2 and 3, until it occupies the position shown in these figures. This, of course, moves the plate G^4 to the right until its edge G^8 releases its hold on the stop H^{13}, permitting the adjusting-screw to move outward until arrested by the abutment of the clamp H^{14} against the edge of the bed-plate. The movement of the plate G^4 draws back the spring-latch H^7, in the manner already described, until its edge ceases to engage the projection M^5. The movement of the plate G^4, also acting on the lever-arms I and I′ and through the lever-arm I′ on the lever J and the parts connected therewith, as already described, causes the clutch to couple the driving-pulley and driving-shaft and start the machine. The plate M is then fed inward, the operation of sewing the buttonholes ensues, as described in the Mills and Moore patent, already referred to, and the projection M^5 finally comes in contact with the plate H^6, and, acting on this plate, draws the adjusting-screw H inward, carrying with it the plate H^{13}, against which the end G^7 of the plate G^4 abuts, and when the inward motion of the adjusting-screw is sufficient to disengage the stop H^{13} and the end G^7 of the sliding plate the action of the spring J^2 is such as to at once force the plate G^4 toward the left and to disengage or uncouple the driving-pinion and driving-shaft, the machine being brought to rest gradually and at the desired point by the action of the clutch and stop mechanism which we have already described.

K^6 is a friction-pin, the upper end of which projects through one of the slide-rests M^{14}, the pin being pressed upward by a spring K^5, which lies in a barrel K^3, and is adjusted in tension by means of a screw-plug K^4. The slot k^3 is formed through the walls of the barrel K, and a corresponding slot k^6 is formed in the side of the plug or pin K^6.

K K′ is a bell-crank lever carrying at the end of its arm K′ a wedge or cam K^2, so arranged that as the lever is turned on its pivotal connection with the bed-plate the cam will pass from a position outside of the slots k^3 and k^6 to a position lying within said slots,

the arrangement being such that as the cam passes into the slot it presses the pin K^6 down and removes the pressure exerted by this pin on the under side of the slide M. The spring-pressure should be exerted on the slide M while the machine is in operation and should be removed from the slide M as soon as the machine stops, so as to permit the easy movement of the slide M by hand to the position in which it receives a new buttonhole, and we impart the proper movement to effect this application and removal of frictional pressure by means of the arm I^2 of the T-shaped lever I I' I^2, which engages the free end of the arm K of the bell-crank lever K K'. It will be observed that when the slide G^4 is moved to the position shown in Figs. 2 and 3, in which the driving-pulley and shaft C are coupled, the movement of the arm I^2 is such as to throw the cam K^2 out toward the slots k^3 and k^6, while the movement of the slide G^4 to effect the release of the clutch draws the cam K^2 into the slots and draws down the friction-pin, releasing the slide M from its pressure.

Having now described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a buttonhole-sewing machine having stitch-forming mechanism substantially as specified, a race-frame as F having a curved raceway F' formed in it, in combination with a race-block adapted to move in said raceway, mechanism for reciprocating said race-block in the curved raceway and mechanism adapted as described to reciprocate the raceway itself substantially in the plane of movement of the race-block.

2. In a buttonhole-sewing machine having stitch-forming mechanism substantially as specified, a race-frame as F having a raceway F' formed in it, in combination with a race-block adapted to move in said raceway, mechanism for reciprocating said race-block in the curved raceway, mechanism adapted as described to reciprocate the raceway itself substantially in the plane of movement of the race-block and mechanism adapted to reciprocate said raceway in a direction transverse to the plane of movement of the race-block.

3. In a buttonhole-sewing machine having stitch-forming mechanism substantially as specified, a race-frame as F having a curved raceway F' formed in it, in combination with a slide supported on the frame of the machine adapted to support the race-frame and permit it to move longitudinally and substantially in the plane of the movement of the race-block as specified, mechanism as cam F^{13} adapted to impart such longitudinal movement to the race-frame, a race-block as E^5 and mechanism for reciprocating said race-block in the raceway.

4. In a buttonhole-sewing machine having stitch-forming mechanism substantially as specified and having a main driving-shaft C, the combination of a race-frame as F having a curved raceway F' and adapted to move longitudinally on the machine-frame and substantially in the plane of the movement of the race-block as specified, with mechanism for so reciprocating the race-frame longitudinally, a race-block adapted to move in the curved raceway, a counter-shaft N driven from shaft C, a cam as E actuated by said counter-shaft and means as described whereby said cam imparts reciprocating movement to the race-block.

5. In a buttonhole-sewing machine having a driving-shaft as C a driving-pulley as C^9 clutch mechanism adapted to connect and disconnect the shaft and pulley and a sliding plate M, the combination with said plate of a friction-pin as K^6 having a spring as K^5 whereby it is pressed against the plate, a pin-retracting device as cam K^2 and connections between the pin-retracting device and clutch-actuating mechanism whereby the pin is allowed to press against the slide when the machine is in motion and retracted when the clutch is disengaged.

6. In a buttonhole-sewing machine having a sliding plate M, the combination with an adjusting-screw as H having stops H^7 H^6 of a projection as M^5 extending downwardly from the plate M adapted to engage said stops and to abut directly against them.

7. In a buttonhole-sewing machine having a sliding plate M, the combination with an adjusting-screw as H of an outer latch-stop H^7 movable in a direction transverse to the axis of the adjusting-screw by which it is supported and found to yield to an outward movement of the sliding plate, a fixed stop H^7 secured to the adjusting-screw and a stop projection M^5 extending down from plate M to engage stops H^6 H^7 as specified.

8. In a buttonhole-sewing machine having a sliding plate M, the combination with an adjusting-screw as H of an outer latch-stop H^7 movable in a direction transverse to the axis of the adjusting-screw by which it is supported and formed to yield to an outward movement of the sliding plate, a fixed stop H^7 also secured to the adjusting-screw, a stop projection M^5 extending down from plate M to engage stops H^6 H^7 as specified, and mechanism for withdrawing and locking stop H^7 out of the path of projection M^5 actuated by the starting mechanism of the machine.

9. In a buttonhole-sewing machine having a driving-shaft and driving-pulley and a clutch for engaging and disengaging said shaft and pulley, a sliding plate as G^4 moving in one direction or the other as the clutch is engaged or disengaged, a spring as J^2 tending to disengage the clutch and to move plate G^4 toward the adjusting-screw, an adjusting-screw H, stops as H^6 H^7 connected thereto, a spring as H^3 tending to hold the adjusting-screw H in its outer normal position, a stop as H^{13} secured to the adjusting-screw and arranged to engage and hold the plate G^4 in position to engage the clutch when the adjusting-screw is in normal position and to release

said plate and permit the clutch to open when the adjusting-screw is depressed.

10. In a buttonhole-sewing machine having a driving-shaft and driving-pulley and a clutch for engaging and disengaging said shaft and pulley, a sliding plate as G^4 moving in one direction or the other as the clutch is engaged or disengaged, a spring as J^2 tending to disengage the clutch and to move plate G^4 toward the adjusting-screw, an adjusting-screw H, stops as H^6 H^7 connected thereto, the stop H^7 being a latch having a movement at right angles to the adjusting-screw, a spring as H^5 tending to hold the adjusting-screw H in its outer normal position, a stop as H^{13} secured to the adjusting-screw and arranged to engage and hold the plate G^4 in position to engage the clutch when the adjusting-screw is in normal position and to release said plate and permit the clutch to open when the adjusting-screw is depressed, a rod H^8 attached to the end of the latch-stop H^7 and engaged in a slot G^9 of plate G^4 said slot being formed and placed as described so that a movement of plate G^4 to engage the clutch will draw back the latch while giving room to draw back the latch when the plate is in its other position.

11. In a buttonhole-sewing machine a main shaft C having a driving-pulley C^9 journaled on its end in combination with a friction-clutch whereby the shaft and pulley are coupled and of which clutch mechanism the arm C^2 pivoted to and revolving with the shaft is a part, said arm being normally pressed out by a spring as C^4 to engage the clutch, a shaft J free to oscillate in fixed bearings, a cam-arm J^9 secured to said shaft and adapted in one position on said shaft to engage the pivoted clutch-arm C^2 and cause it to move away from the pulley while in the other position of said shaft it is moved out so as not to engage the arm C^2, a spring-buffer J^8 also secured to shaft J and thrown into and out of position to engage the arm C^2 by the movements of said shaft and mechanism for moving shaft J to start and stop the machine.

12. In a buttonhole-sewing machine a main shaft C having a driving-pulley C^9 journaled on its end in combination with a friction-clutch whereby the shaft and pulley are coupled and of which clutch mechanism the arm C^2 pivoted to and revolving with the shaft is a part, said arm being normally pressed out by a spring as C^4 to engage the clutch, a shaft J free to oscillate in fixed bearings a cam-arm J^9 secured to said shaft and adapted in one position on said shaft to engage the pivoted clutch-arm C^2 and cause it to move away from the pulley while in the other position of said shaft it is moved out so as not to engage the arm C^2, said arm J^9 having a depression J^{10} near its base to engage and hold the arm C^2, a spring-buffer J^8 also secured to shaft J and thrown into and out of position to engage the arm C^2 by the movements of said shaft and mechanism for moving shaft J to start and stop the machine.

13. In a buttonhole-sewing machine having an adjusting-screw H with stops H^6 H^7 secured thereto a slide M, a friction-pin K^6 arranged to press against the said slide and a clutch adapted to couple and uncouple the shaft and driving-pulley, the combination with the sliding plate G^4, the cam K^2 and lever K K′ actuating said cam, the clutch-actuating shaft J and its lever-arm J^3 with the T-shaped lever I I′ I^2 whereby said parts are moved simultaneously.

14. In a buttonhole-sewing machine the combination with slide M of a rack M′ and a link M^2 said link being pivotally connected at one end to the slide and at the other to the rack.

15. In a buttonhole-sewing machine the combination of the slide M of a rack M′ and a link M^2 said link being pivotally connected at one end to the slide and at the other to the rack and lying in a line forming an acute angle to the normal operative position of said rack.

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Witnesses:
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